1969 OPERATING SUMMARY

TRENTON

water pollution control plant

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JUN 26 1970
ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

The operating efficiency and financial status of the water pollution control facilities operated for you in 1969 are presented in the following pages.

The regional operations engineer's comments and the statistical data will assist you in gauging the plant's level of performance. A new flow chart and up-to-date design data are also provided.

Various divisions and sections within the Commission have co-operated in providing what we trust is an accurate and concise annual operating summary.

D.S. Caverly,
General Manager.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

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RESOURCES COMMISSION

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TRENTON

water pollution control plant

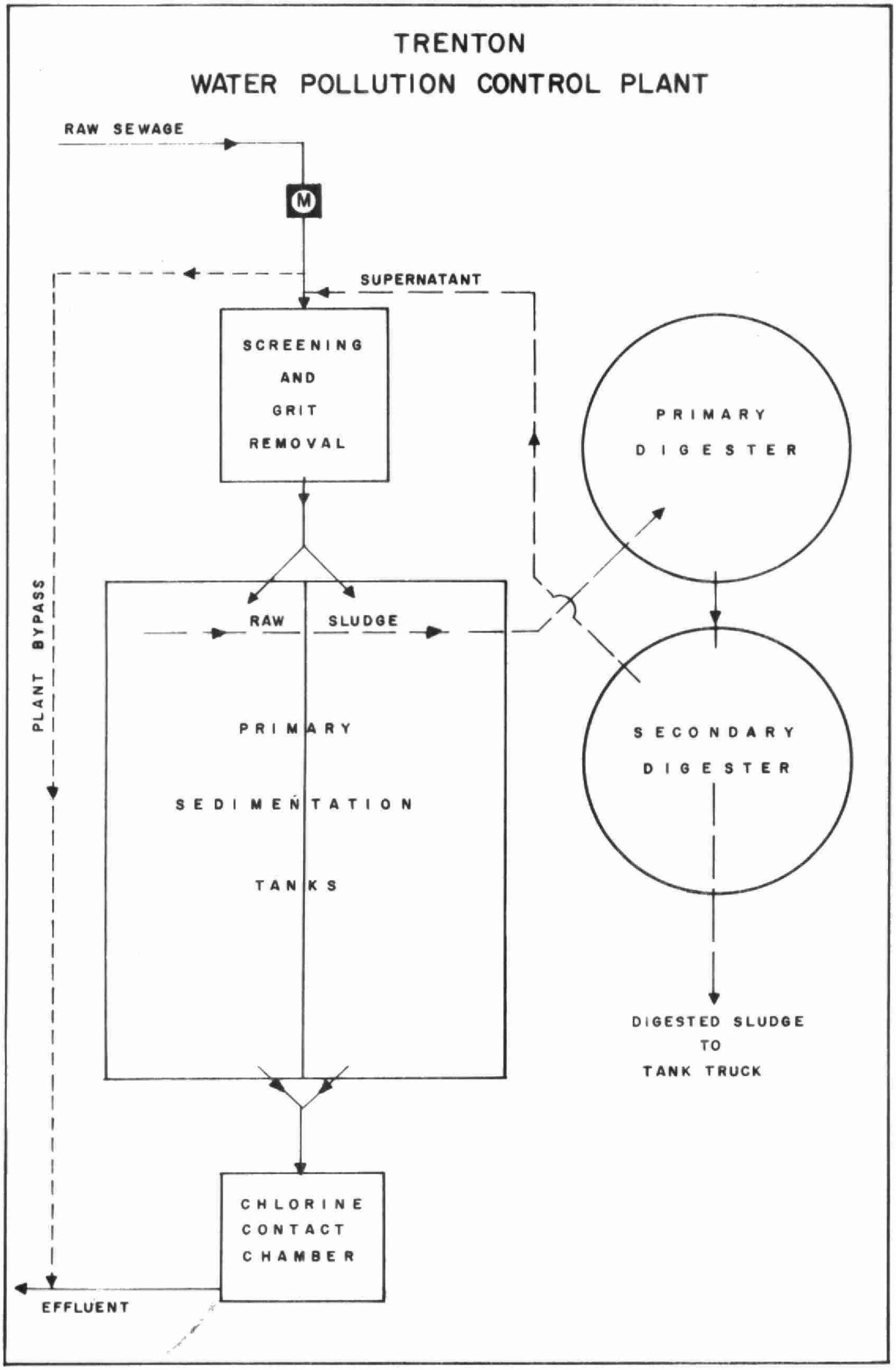
operated for

THE TOWN OF TRENTON

by the

ONTARIO WATER RESOURCES COMMISSION

1969 ANNUAL OPERATING SUMMARY



TRENTON
WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT NO.	2-0004-57	TREATMENT	Primary
DESIGN FLOW	1.0 mgd	DESIGN POPULATION	12,000
BOD - Raw Sewage - Removal	250 mg/l 35%	SS - Raw Sewage - Removal	200 mg/l 55%

PRIMARY TREATMENT

Grit Removal

Type: Aerated, with air lift
Size: One 10' x 9' x 8½' (4,775 gal)
Retention: 1.5 min

Primary Sedimentation

Type: Jeffrey
Size: Two 52' x 16' x 12' (125,000 gal)
Retention: 3.0 hr
Loading: Surface, 600 gal/ft^2/day
Weir, 8340 gal/ft/day

Air Supply

Two Roots-Connersville

CHLORINATION

Type: F & P

Chlorine Contact Chamber

- not provided; chlorination in outfall

OUTFALL

- 850 ft of 30" concrete pipe to Bay of Quinte

SLUDGE HANDLING

Digestion System - Two-stage

Primary --
Type: Gas mixed, fixed cover; PFT
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Loading: 2.62 lb/cu ft/mo

Secondary --
Type: Fixed cover
Size: One 28' dia x 23' (13,500 cu ft or 84,000 gal)
Total Loading: 1.31 lb/cu ft/mo

PUMPING STATIONS

Dundas Street Pumping Station

Type: Fairbanks-Morse
Size: One 700 gpm @ 39' tdh
One 1740 gpm @ 48' tdh
One 3130 gpm @ 68' tdh (diesel)

'69 REVIEW

GENERAL

The pyrotenex feeder lines from the transformer station to the plant were grounded in October. This was corrected by installing an overhead service to the treatment plant.

The plunger was replaced in one of the raw sludge pumps. The solenoid valves for the control of the raw sludge pumps were also replaced.

The sludge circulating pump was rebuilt, acquiring a new shaft, sleeve, bearings, and impeller. A new motor was purchased for the sludge collector gear drive. The effluent water pump which supplies water for the chlorinator and the plant grounds was completely overhauled. The two motors driving the blowers which provide air to the degritter system were dismantled and baked to protect the insultation.

The boiler was converted to operate on natural gas as a standby fuel rather than the fuel oil that had been originally used. This improved the operation of the boiler considerably, and proved to be more satisfactory than originally expected.

In the Dundas St. pumping station, the No. 1 pump and motor were completely overhauled. The pump sleeve and bearings were replaced, while the motor was taken to a repair shop and baked to protect the insulation.

A new project (2-0225-67) was put into operation in June. This included trunk sewers and the Bay St. pumping station. Early minor difficulties experienced with the latter were corrected. After the connection of the Bay St. pumping station, the capacity of the plant flow meter was exceeded, necessitating repairs. It was decided that the range of the meter should be increased to 8,000,000 gallons per day to prevent this from recurring. This alteration could not be made in 1969 due to slow delivery of the replacement parts.

Reserve Fund spendings were authorized for the purchase of a ½ ton pick-up truck to be shared between the Town of Trenton and the Township of Sidney; for the conversion of the heating system at the Dundas St. pumping station to electrical heating, and for the meter modifications.

An engineering report prepared by Gore & Storrie Ltd. on the expansion of the Trenton Sewage System was received in January. The report included construction costs for treatment of the Town of Trenton wastes and two alternatives: inclusion of either Domtar Newsprint Ltd. or Stokely Van Camp Ltd. The industries were advised of the costs, and were requested to indicate whether they were interested in participating in this system, or in handling their own waste. In September, both industries indicated they would handle waste treatment on their own. Ensuing negotiations between the industries and the OWRC delayed the finalizing of the engineering report till December 1969. The expansion will now consider the Town's waste only.

The Town of Trenton passed an industrial waste by-law in June, 1969.

EXPENDITURES

The cost of operating the Trenton Water Pollution Control Plant in 1969 was $28,799.25, an increase of about 10% over the previous year's $26,431.57.

PLANT FLOWS and CHLORINATION

Flow recordings were available for only six months of 1969. This was due to the start-up of the Bay St. pumping station which, when operating at maximum capacity with the Dundas St. station, exceeded the capacity of the plant flow meter. The average daily flow for the first six months of 1969 was 2.1 million gallons, while the maximum daily flow was 4.1 million gallons in May. The minimum daily flow of one million gallons occurred in January.

Authorization was received to modify the plant flow meter in August, but a delay in parts' delivery precluded connection in 1969.

The average daily flow in 1968 was 1.28 million gallons.

The total amount of chlorine used to disinfect the effluent was 21,412 lbs. This resulted in an average dosage of 2.2 mg/l. Chlorination is used to disinfect the effluent before discharge to the Bay of Quinte.

PLANT EFFICIENCY

The average BOD and suspended solids in the raw sewage was 188 and 246 mg/l respectively, and 118 and 109 mg/l in the plant effluent. This resulted in BOD and suspended solids reductions of 37 and 56%.

The suspended solids in the waste were somewhat similar to those in 1968. However, BOD was somewhat reduced from the 1968 average value of 331 mg/l. This may have been caused by the increased flow to the plant due to the connection of new sewers to the system in the spring.

The quantity of raw sludge pumped to the digester was 1,913,000 gallons, with a total solids concentration of 5.6%. The quantity of digested sludge removed from the digesters was 663 cubic yards, with an average concentration of 11.3%. The concentrations of both the raw and the digested sludge were excellent values for this type of operation.

CONCLUSIONS

A satisfactory reduction of BOD and suspended solids was achieved at the plant despite the overloaded condition.

The preparation of the engineering report was delayed due to the indecision of the industries on whether to treat their own wastes or be included in the plant enlargement. The firm of Gore and Storrie was directed to begin the report early in 1970.

PROJECT COSTS

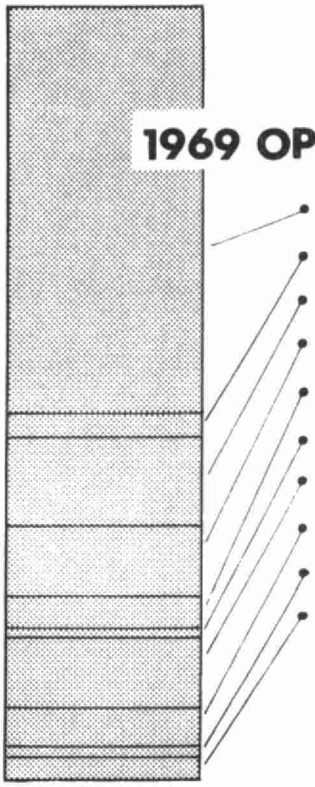
NET CAPITAL COST (Final) Long Term Debt to OWRC	$515,665.11
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1969	$137,706.48

Net Operating	$ 28,799.25
Debt Retirement	10,406.00
Reserve	1,673.18
Interest Charged	28,869.43
TOTAL	$ 69,747.86

RESERVE ACCOUNT

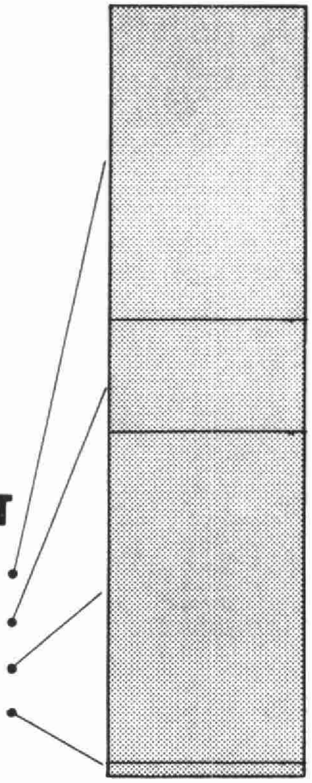
Balance @ January 1, 1969	$ 34,044.76
Deposited by Municipality	1,673.18
Interest Earned	1,786.24
	$ 37,504.18
Less Expenditures	4,246.68
Balance @ December 31, 1969	$ 33,257.50

1969 OPERATING COSTS



PAYROLL	52 %
FUEL	3 %
POWER	12 %
CHEMICALS	9 %
GENERAL SUPPLIES	4 %
EQUIPMENT	1 %
REPAIRS & MAINTENANCE	9 %
SUNDRY	5 %
WATER	2 %
TRAVEL	3 %

TOTAL ANNUAL COST



NET OPERATING	41 %
DEBT RETIREMENT	15 %
INTEREST	42 %
RESERVE FUND	2 %

Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1965	214.87	$19,519.53	$90.84	5 cents
1966	233.76	19,154.53	81.94	5 cents
1967	405.32	22,513.98	55.55	3 cents
1968	466.88	26,431.57	56.61	4 cents
1969	401.70*	28,799.25	36.84	5 cents

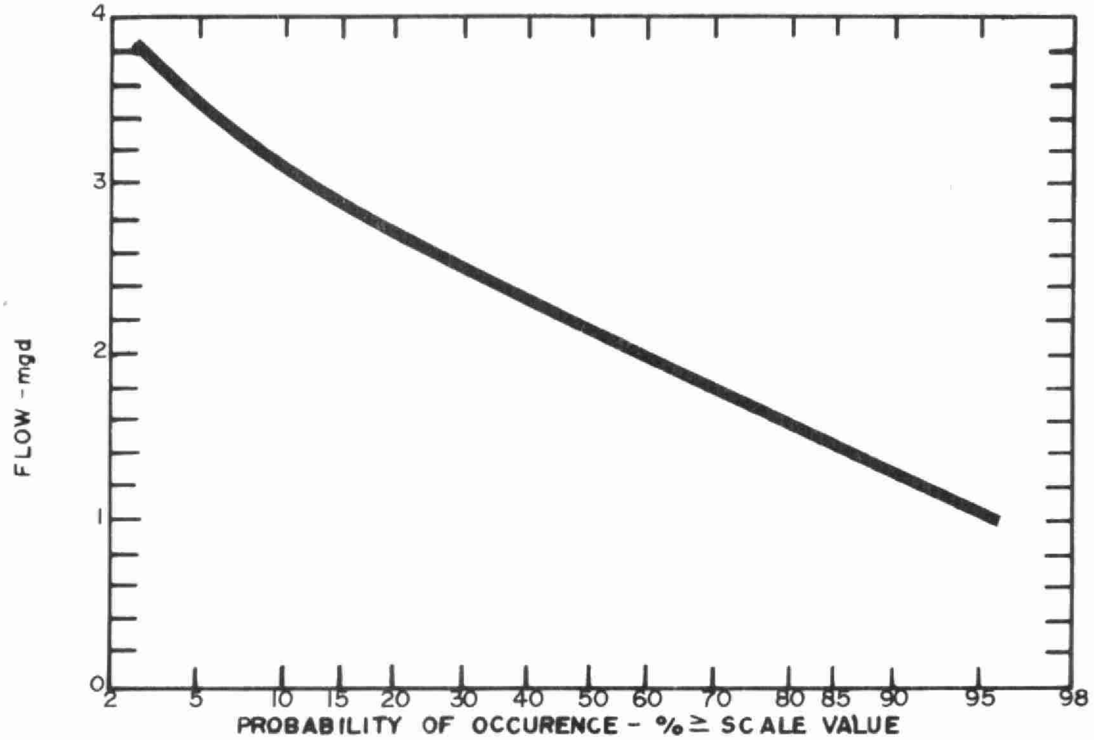
* 184 days' flow

Monthly Operating Costs

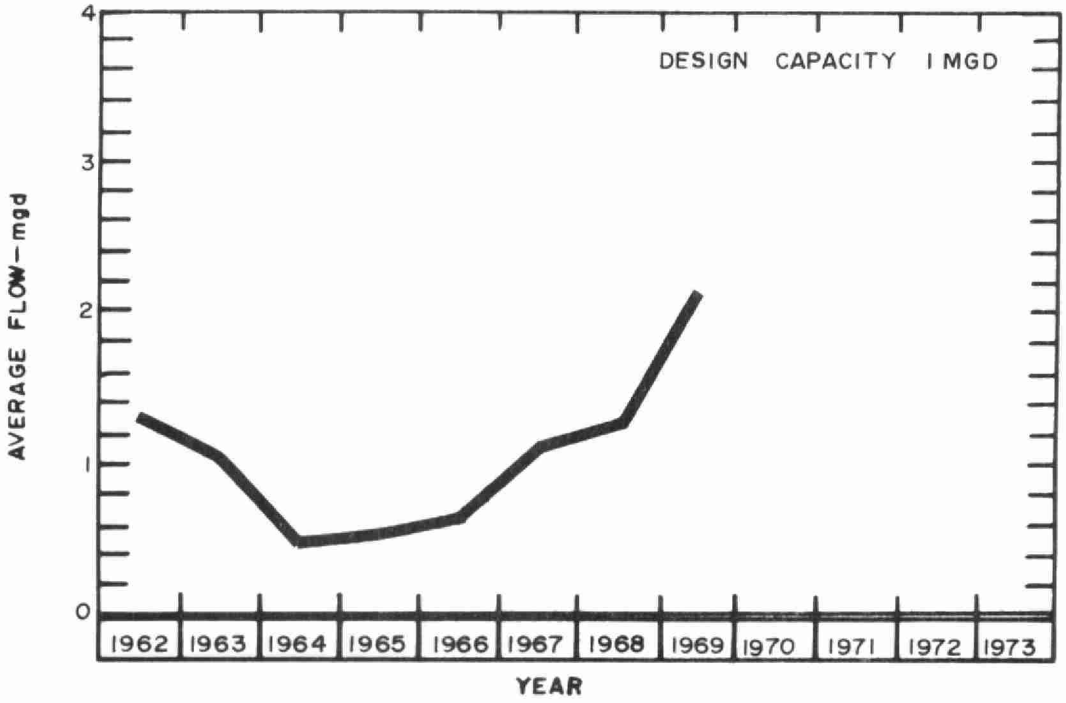
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY	WATER	TRAVEL
JAN	2225.16	1349.87	493.50	56.03	251.98	-	-	-	-	20.27	21.71	31.80
FEB	2206.74	1181.48	-	97.17	266.20	-	130.26	177.42	279.19	14.08	19.77	41.17
MAR	2464.16	918.54	-	142.94	310.68	477.23	38.43	-	443.85	60.77	18.77	52.95
APR	2285.54	1336.33	-	-	296.85	-	71.89	-	-	539.65	22.07	18.75
MAY	2820.86	1227.51	-	84.16	318.18	441.00	226.33	(321.10)	693.87	67.30	25.76	57.75
JUNE	1761.29	1063.15	-	196.51	303.03	-	91.45	-	-	18.72	27.03	61.40
JULY	2186.85	1086.71	-	71.78	338.65	220.50	200.90	27.33	-	39.92	44.94	156.12
AUG	3495.99	1878.50	-	50.04	267.81	220.50	112.19	-	810.04	20.63	79.43	56.85
SEPT	2595.48	1030.57	-	40.08	294.42	441.00	66.90	46.56	450.29	16.64	163.26	45.76
OCT	2299.96	1163.97	-	37.98	290.92	441.00	97.42	147.79	-	-	62.01	58.87
NOV	2265.08	1207.32	-	43.15	305.65	441.00	92.42	-	-	69.99	59.58	45.97
DEC	2192.14	905.46	-	103.55	329.95	-	115.47	-	-	576.10	51.39	110.22
TOTAL	28799.25	14349.41	493.50	923.39	3574.32	2682.23	1243.66	78.10	2677.24	1444.07	595.72	737.61

BRACKETS INDICATE CREDIT

PROCESS DATA


4
3
2
1
0
FLOW - mgd
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PROBABILITY OF OCCURENCE - % ≥ SCALE VALUE

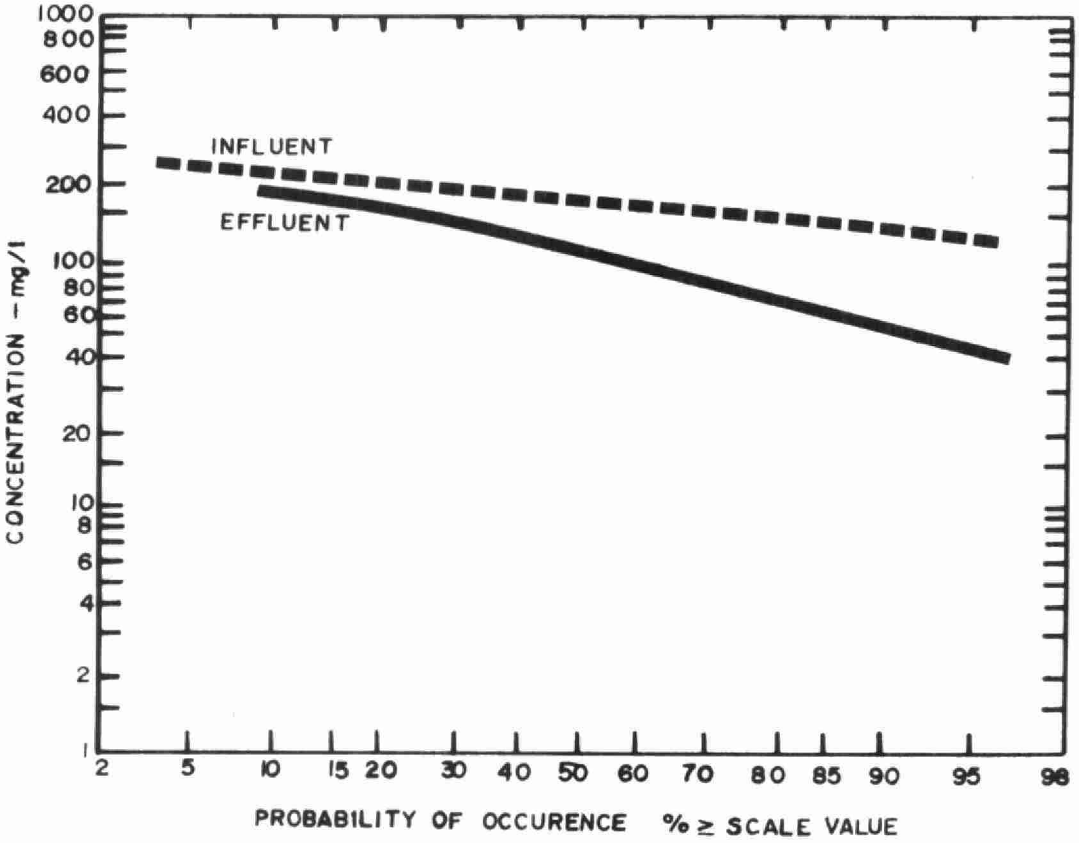
FLOWS


DESIGN CAPACITY I MGD
4
3
2
1
0
AVERAGE FLOW - mgd
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
YEAR

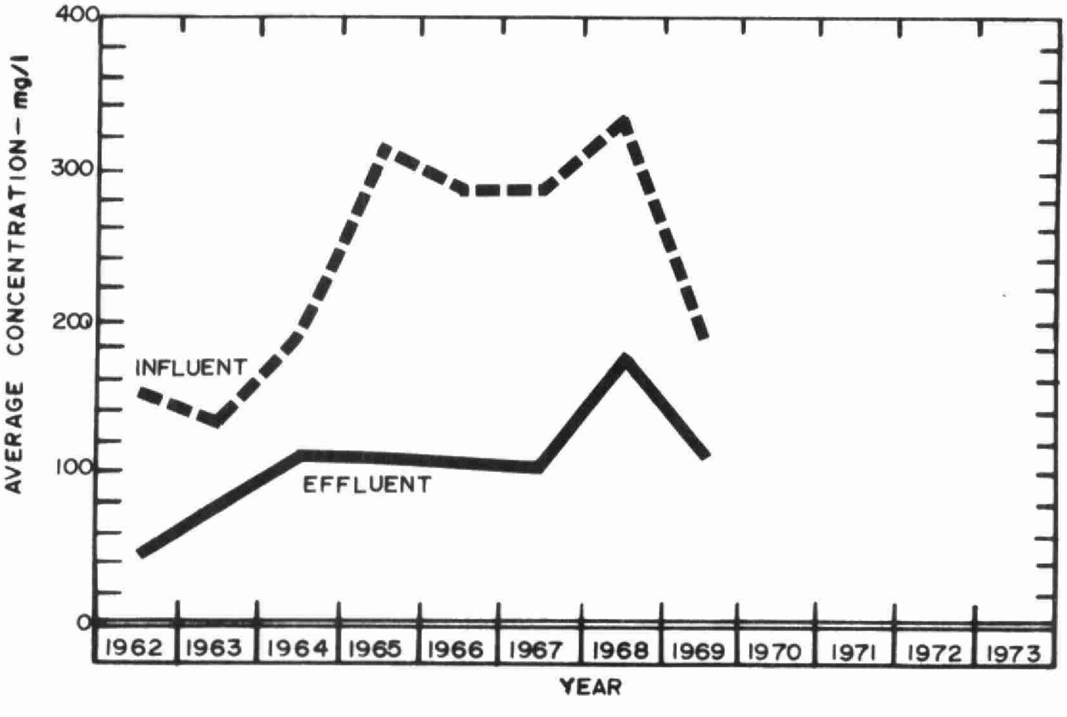
PLANT FLOWS and CHLORINATION

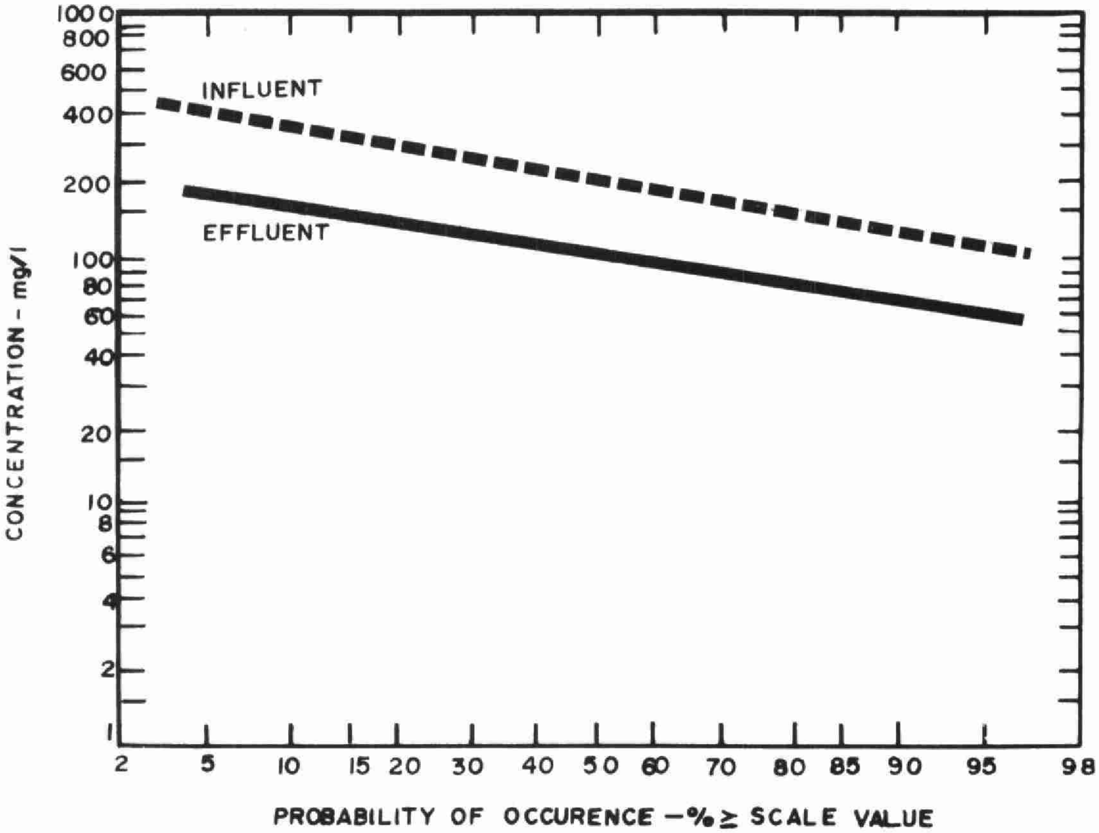
MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10^3 pounds	DOSAGE mg/l
JAN	46.3	1.5	3.8	1.0	1.08	2.6
FEB	48.4	1.7	2.2	1.5	1.22	2.5
MAR	67.5	2.2	3.6	1.6	1.53	2.3
APR	76.0	2.5	3.4	1.8	1.44	1.9
MAY	89.1	2.9	4.1	2.0	1.42	1.6
JUNE	59.4	2.1	2.4	1.4	1.38	2.3
JULY	15.0*	2.4	3.4	2.0	1.41	-
AUG	**	-	-	-	1.58	-
SEPT	**	-	-	-	2.14	-
OCT	**	-	-	-	2.61	-
NOV	**	-	-	-	2.69	-
DEC	**	-	-	-	2.91	-
TOTAL	770***	-	-	-	21.41	-
AVERAGE	-	2.1	-	-	1.78	2.1

* Six days' flow, meter out of service
** Meter out of service
*** Estimated on 184 days' flow

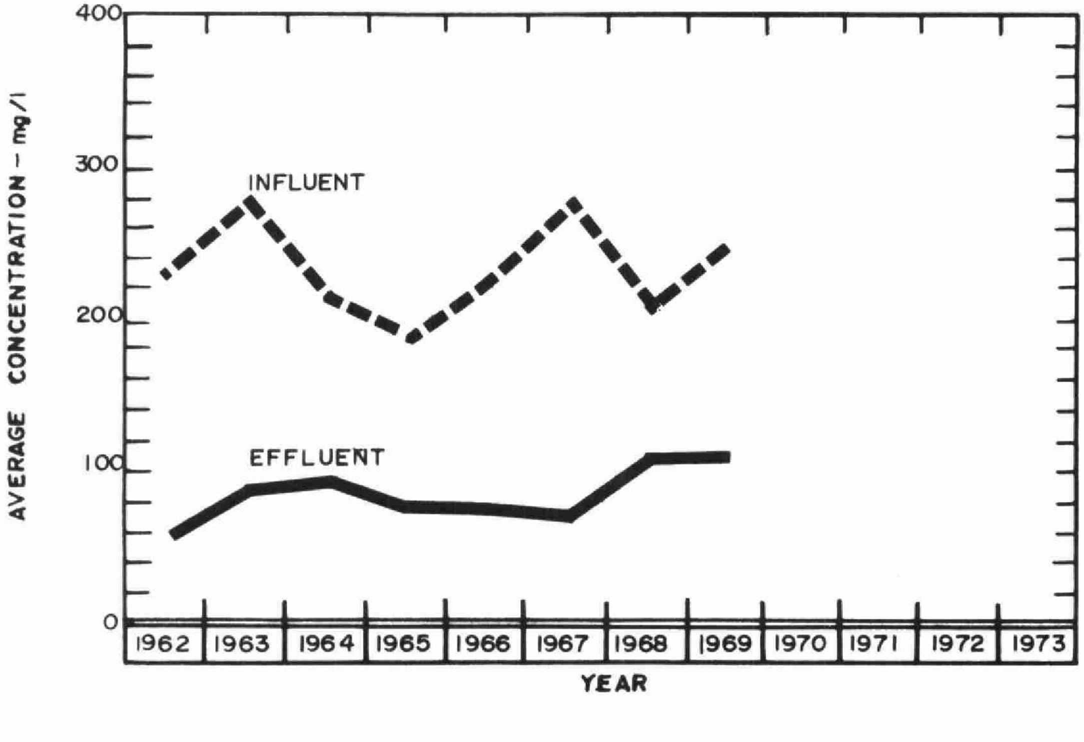


BIOCHEMICAL OXYGEN DEMAND



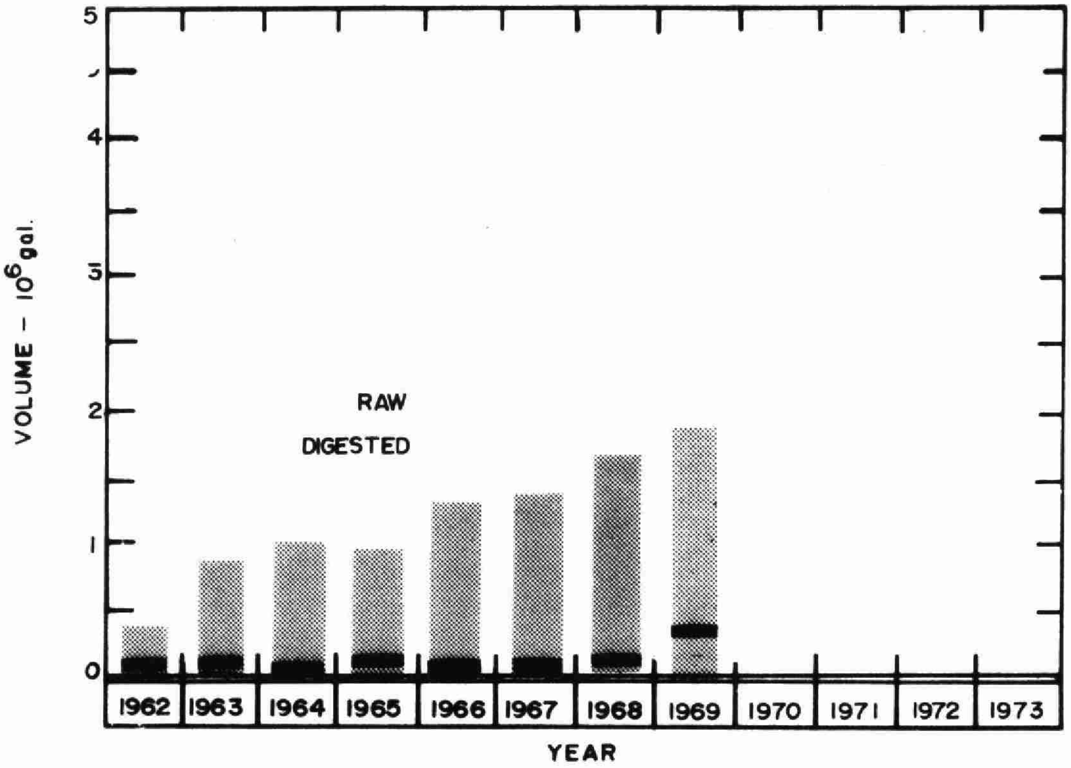


SUSPENDED SOLIDS

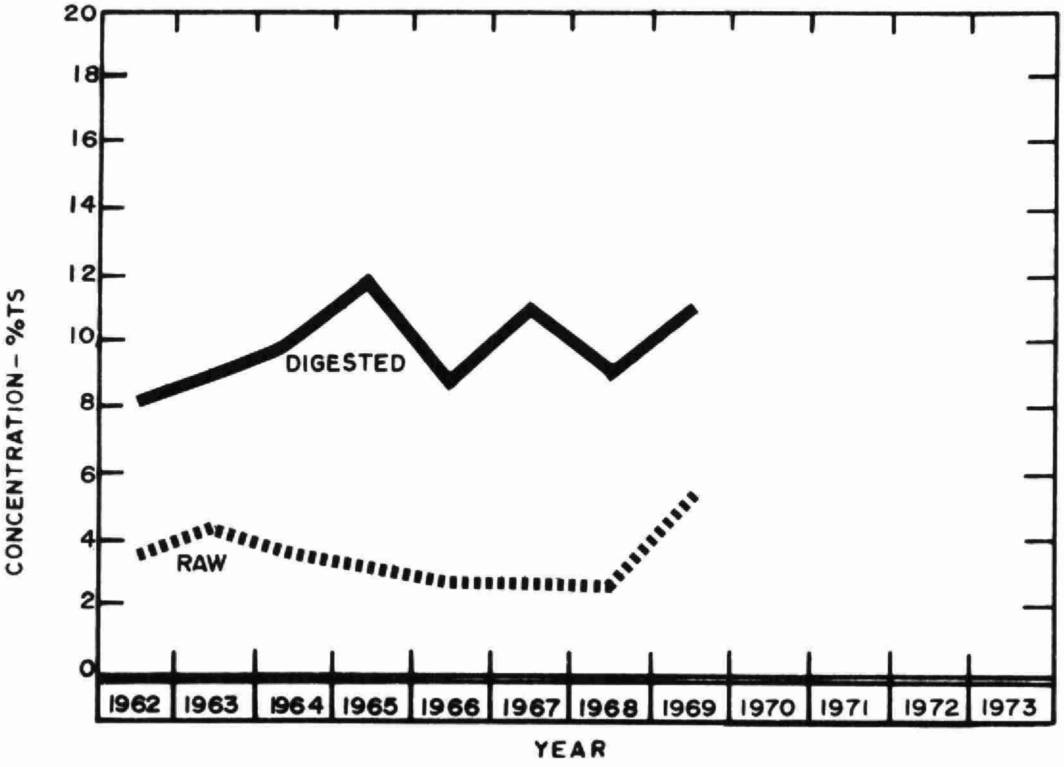


PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				GRIT REMOVAL
	INF.	EFF.	REDUCTION		INF. CONCN	EFF. CONCN	REDUCTION		
	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	cu ft
JAN	200	100	50	46.	350	100	71	116.	0
FEB	150	90	40	29.	650	190	71	223.	0
MAR	220	160	27	40.	150	110	27	270.	0
APR	300	160	47	106.	330	110	67	167.	60
MAY	130	80	33	44.	100	90	10	9.	0
JUNE	240	160	33	48.	160	110	31	30.	60
JULY	260	160	38	75.	200	120	40	60.	60
AUG	240	148	38	-	230	110	38	-	0
SEPT	160	150	6	-	260	120	54	-	48
OCT	130	80	38	-	220	80	64	-	75
NOV	100	55	45	-	130	80	38	-	121
DEC	135	67	67	-	180	90	50	-	104
TOTAL	-	-	-	-	-	-	-	-	528
AVERAGE	188	118	37	55.	246	109	56	125.	-


5
4
3
2
1
0
VOLUME - 10^6 gal.
RAW
DIGESTED
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
YEAR

DIGESTION


20
18
16
14
12
10
8
6
4
2
0
CONCENTRATION - %TS
DIGESTED
RAW
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
YEAR

SLUDGE DIGESTION and DISPOSAL

MONTH	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT		SLUDGE DISPOSAL	
	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^3 gal	TOTAL SOLIDS %	VOL SOLIDS %	VOLUME 10^3 gal	TOTAL SOLIDS %	DEWATERED cu yd	LIQUID cu yd
JAN	163.	3.4	-	10.	-	-	163.	-	0	60
FEB	147.	2.8	-	26.	-	-	147.	-	0	155
MAR	163.	4.8	-	5.	14.0	-	163.	.3	0	30
APR	156.	1.7	-	0	9.5	-	118.	.4	0	0
MAY	159.	3.2	-	8.	14.9	-	159.	1.6	0	48
JUNE	156.	7.7	-	7.	14.6	-	156.	.6	0	42
JULY	163.	5.6	-	0	15.5	-	163.	.4	0	0
AUG	165.	-	-	30.	-	-	158.	-	0	177
SEPT	157.	5.7	-	0	8.7	-	157.	-	0	0
OCT	164.	8.7	51	18.	10.8	40	164.	-	0	105
NOV	158.	12.2	-	35.	5.8	-	121.	.5	0	210
DEC	162.	6.2	-	13.	8.1	-	162.	.5	0	75
TOTAL	1913.	-	-	152.	-	-	1831.	-	0	702
AVERAGE	159.	5.6	51	13.	11.3	40	153.	.6	0	75

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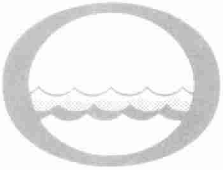

Water management in Ontario